AMENDMENTS TO THE CLAIMS

The following claims replace all prior versions and listings of claims in the application:

Claims 1-6 (cancelled).

7.   (Previously Presented)   A method for reducing data loss in the event of packet loss in a modem relay connection over a packet network including a transmitting modem and a transmitting gateway, a receiving modem and a receiving gateway, the method comprising:

providing a packet format including a header portion, a sequence number and a data portion;

dividing said data portion into a plurality of segments; designating one of said segments as a new data segment;

providing sequential blocks of modem data from said transmitting modem to said transmitting gateway;

retaining a predetermined number of sequential blocks of modem data at said transmitting gateway, by dropping the oldest block and retaining the most recent block;

providing the most recent block of data in said designated new data segment of said

data portion of said packet;

providing the remaining retained blocks of data in the remainder of said

segments;

wherein:

each time said transmitting gateway receives a new block of data from said

transmitting modem, said oldest block is dropped from said retained set of data,

said new block of data is encoded in the next data packet as the new data block;

and

said remaining retained blocks are encoded into said data packet as redundant

data blocks; ~~and~~

wherein the redundant data blocks are added by a data redundancy with a

repetition count *k*, and

wherein the redundancy is performed as data encoding into each packet,

according to the following formula where x is the current packet sequence number, *N*

represents data bits corresponding to each packet as the packet is, and

each iteration encodes data bits for the current packet *x* and previous packets

into the data length of the current packet, the addition sign signifying grouping the data

bits together in a block within the packet for each iteration:

$$[x\text{-}j]N + [x\text{-}i]N$$

<u>where i = (0 to (k - 1)) and j = (1 to k) and each of the variables *i, j* increase by 1</u>

<u>in each iteration up to *k* levels of iterations that are performed for each packet.</u>

transmitting said packets from said transmitting gateway to said receiving gateway.

8.   (Previously Presented)   The method of claim 7, wherein said lost

packet recovery at said receiving gateway includes:

receiving said transmitted packets;

reading said sequence numbers of consecutively received packets to determine

packet loss, including;

comparing the sequence number of sequentially received packets, and

determining the difference in the compared sequence numbers; and providing the

redundant data corresponding to data lost during said packet loss, to said receiving

modem.

9.   (Previously Presented)   The method of claim 8, wherein the number of said

retained predetermined number of sequential blocks is re-negotiated when said number

of detected missing packets exceeds said retained predetermined number of sequential

blocks between the two gateways.

10. (Previously Presented) The method of claim 9, further including detection of

a value of the number of lost packets which exceeds the value of said retained

predetermined number of sequential blocks;

said receiving gateway reporting said detection; and

adjusting the redundancy to compensate for increases in packet loss across said

packet network.

11-16 (cancelled)

17. (Withdrawn) A method for modem relay communication between two users,

each using a computing device with a modem connected to a modem relay unit,

comprising: establishing a modem relay network by connecting a first local modem to a

first modem relay unit (MRU) and by connecting a second local modem to a second

modem relay unit (MRU), the first MRU and the second MRU being connected over a

packet network;

transmitting call setup commands from the first MRU to the second MRU by

seizing the line, with the first MRU, from the first modem to the first MRU after dialing

the second modem from the first modem;

seizing the line, with the second MRU, from the second modem to the second MRU and

transmitting an answer tone from the second modem to the second MRU after the

second modem answers the call setup commands;

performing a handshake between the first MRU and the second MRU using MRU

handshake message packets sending while keeping modem data pumps of each MRU

turned off;

performing local handshakes between the first MRU and the first local

modem and between the second MRU and the second modem;

after the local handshakes are reported, starting the modem data pumps in each

MRU;

establishing the modem relay channel by transmitting and replying to modem

relay message packets between the first MRU and the second MRU; and transmitting

data streams between the first and second modems via the first MRU

modulating/demodulating a first full duplex data stream between the first modem and

the first MRU, packetizing the data stream, transmitting the packetized data stream

across the packet network to the second MRU, and modulating/demodulating a second

full duplex data stream between the second modem and the second MRU.

18.   (Withdrawn) The method of claim 17, further comprising:

using the same modem connection rates and same compression codecs for

transmissions between the first modem and first MRU and between the second modem

and the second MRU.

19.   (Withdrawn) The method of claim 17, wherein the transmitting the call setup commands further comprises setting a voice channel in a DSP of the second MRU after receiving the setup commands from the first MRU, and

wherein the performing the handshake between the first MRU and the second MRU further comprises switching the voice channel in the second MRU to a modem relay channel.

20.   (Withdrawn) The method of claim 17, wherein the establishing the modem relay channel comprises transmitting modem relay packets that include an RTP header and time stamp, a field indicating an MRU protocol version, and a digital field indicating whether the packet is a protocol state packet, a handshake stake packet, or a data packet.

21.   (Withdrawn) The method of claim 17, further comprising:

detecting, at the second MRU determines, if the answer tone from the second modem is a V.25 answer tone with phase reversal present, and if detected, then switching from a voice processing channel to a modem relay processing channel

wherein the transmitting the answer tone from the second modem comprises

determining.

22.   (Withdrawn) The method of claim 21, further comprising:

detecting if a V.25 answer tone with phase reversal is not present in the answer tone

from second modem, and if not detected, then detecting for facsimile relay processing

in the answer tone.

23.   (Withdrawn) A system for modem relay communication between two users, each

using a computing device with a modem connected to a modem relay unit, comprising

        a modem relay network comprising a first local modem connected to a first

modem relay unit (MRU) that includes first modem relay DSP and a second local

modem connected to a second modem relay unit (MRU) that includes a second modem

relay DSP, the first MRU and the second MRU being connected over a packet network,

wherein, the first MRU transmits call setup commands to the second MRU by seizing

the line, with the first MRU, from the first modem to the first MRU after dialing the

second modem from the first modem,

        the second MRU seizes the line to the second modem and the second

modem transmits an answer tone to the call setup commands to the second MRU,

the first MRU and the second MRU handshake using handshake message

packets sending while keeping modem data pumps of each MRU turned off,

the first MRU and the first local modem handshake and the second MRU and the

second modem handshake,

the DSP in each MRU start the modem data pumps,

the first MRU and the second MRU establish the modem relay channel by

transmitting and replying to modem relay message packets between them, and

the first and second modems transmit data streams via the first MRU

modulating/demodulating a first full duplex data stream between the first modem and

the first MRU, packetizing the data stream, transmitting the packetized data stream

across the packet network to the second MRU, and modulating/demodulating a second

full duplex data stream between the second modem and the second MRU.

24.   (Withdrawn) The system of claim 23, wherein the first modem and first MRU and

the second modem and the second MRU operate using the same modem connection

rates and the same compression codecs.

25.   (Withdrawn) The system of claim 23, wherein the DSP of the of the second

MRU sets up a voice channel after receiving the setup commands from the first MRU,

and after the first MRU and the second MRU handshake, switches the voice channel in

the second MRU to a modem relay channel.

26. (Withdrawn) The system of claim 23, wherein the first MRU and second MRU transmit modem relay packets that include an RTP header and time stamp, a field indicating an MRU protocol version, and a digital field indicating whether the packet is a protocol state packet, a handshake stake packet, or a data packet.

27. (Withdrawn) The system of claim 26, wherein the second MRU switches from the voice processing channel to the modem relay processing channel if the answer tone from the second modem is a V.25 answer tone with phase reversal.

28. (New) A method for modem relay data redundancy, comprising:

establishing a modem relay transmission between a first modem relay unit (MRU) and a second MRU over a packet network,

wherein the each packet in the transmission between the MRUs is formatted with a sequence number uniquely assigned to each packet;

negotiating a data redundancy repetition count k between the first and the second MRUs;

applying a data redundancy to the modem relay transmission,

11

wherein the redundancy is performed as data encoding into each packet,

according to the following formula where x is the current packet sequence number, N

represents data bits corresponding to each packet as the packet is, and

each iteration encodes data bits for the current packet x and previous packets

into the data length of the current packet, the addition sign signifying grouping the data

bits together in a block within the packet for each iteration:

$$[x-j]N + [x-i]N$$

where i = (0 to (k - 1)) and j = (1 to k) and each of the variables i, j increase by 1 in

each iteration up to k levels of iterations that are performed for each packet.

29.   (New) The method of claim 28, wherein each k iteration of the data redundancy

in each packet encodes together bits of data N from a first packet and a second packet

paired together, and

wherein the second packet has the preceding packet sequence number to the

first packet in the transmission.

30.   (New) A system for modem relay, comprising:

a first modem relay unit (MRU) transmitting packetized data over a packet

network to a second MRU;

12

wherein the first MRU formats each packet in the transmission with a sequence

number uniquely assigned to each packet,

the first and the second MRUs negotiate a data redundancy repetition count k

between the first and the second MRUs,

the first MRU applies a data redundancy to the modem relay transmission,

wherein the redundancy is performed as data encoding into each packet,

according to the following formula where x is the current packet sequence number, N

represents data bits corresponding to each packet as the packet is, and

each iteration encodes data bits for the current packet x and previous packets

into the data length of the current packet, the addition sign signifying grouping the data

bits together in a block within the packet for each iteration:

$$[x-j]N + [x-i]N$$

where i = (0 to (k - 1)) and j = (1 to k) and each of the variables i, j increase by 1 in

each iteration up to k levels of iterations that are performed for each packet.

31.   (New) The system of claim 30, wherein each k iteration of the data redundancy in

each packet encodes together bits of data N from a first packet and a second packet

paired together, and

wherein the second packet has the preceding packet sequence number to the

first packet in the transmission.

32.   (New) The method of claim 7, wherein each *k* iteration of the data redundancy

in each packet encodes together bits of data *N* from a first packet and a second packet

paired together, and

wherein the second packet has the preceding packet sequence number to the

first packet in the transmission.